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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/521,424

08/12/2005

Atakan Peker

L2:00536

1859

71897

7590

07/15/2008

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EXAMINER

SHEVIN, MARK L

ART UNIT

PAPER NUMBER

1793

MAIL DATE

DELIVERY MODE

07/15/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/521,424	Applicant(s) PEKER, ATAKAN	
	Examiner Mark L. Shevin	Art Unit 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 June 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 May 2008 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Status of Claims

1. Claims 1-20, filed June 23rd, 2008 are pending. Claim 2 has been amended and claims 21-28 have been cancelled.

Acknowledgement of RCE

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on June 23rd, 2008 has been entered.

Status of Previous Rejections

3. The previous rejection of claims 1-8, 10-17, and 19-20 under 35 U.S.C. 103(a) over **Peker** (US 5,866,254) in view of **Suresh** (Fundamentals of Metal-Matrix Composites...) and **Peker-Johnson** (US 5,288,344) in the Office action dated March 21st, 2008, **have been maintained.**

Providing a feedstock of a bulk solidifying amorphous alloy having the capability of retaining an amorphous state when cooled from above its melting temperature at a critical cooling rate of no more than about 500 °C/S (col 2, lines 14-19).

Peker '254, drawn to a composite material having reinforcement material, desirably particles of refractory ceramics, bonded into an amorphous metal matrix (col. 1, lines 10-12), teaches that the matrix material is preferably a bulk solidifying amorphous alloy, defined as "having a capability of retaining the

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amorphous state when cooled from its melt at a critical cooling rate of no more than 500 °C per second (col. 2, lines 5-20).

Dispersing a plurality of pieces of a reinforcement material throughout the bulk solidifying amorphous alloy feedstock to form a mixture of reinforcement material and bulk solidifying amorphous alloy feedstock

Peker '254 teaches that a plurality of pieces of reinforcement material in the form of particles or fibers are dispersed in the bulk solidifying amorphous alloy matrix (col. 2, lines 20-35).

Densifying the mixture by applying a force to the mixture at a densification temperature above the melting temperature of the bulk solidifying amorphous alloy for a specified densification time

Peker '254 teaches that in dispersing operation of infiltrating the molten bulk metallic glass mixture into a mass of reinforcement, "the matrix material is heated...and allowed to flow into the mass of reinforcement particles...or alternatively forced into the mass of reinforcement particles under pressure (col 7, lines 29-34). Peker '254 does not explicitly teach the densification of the mixture by applying a force to the molten bulk metallic glass-forming metal.

Suresh teaches the densification of a metal matrix composite by applying a force to the composite at a temperature above the melting point of the metal matrix. In the analogous process of pressure-driven infiltration (very analogous given that Peker '254 mentions "infiltration" in col 8, "Ex 1."), this process is used to overcome poor wetting (p. 5, col 1, para 2, lines 1-5) and generally yields a pore-free matrix (p. 5, col 2, para 1, lines 10-12). Furthermore this process has additional benefits including, "increased processing speed, and better soundness

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of the product through feeding of solidification shrinkage.” (p. 5, col 1, para 2, lines 5-9)

The process of densifying is carried out at a "densification temperature" in the broadest reasonable sense of the phrase as Peker '254 teaches (Col. 7, lines 29-34) that "the matrix material is heated...and allowed to flow into the mass of reinforcement particles...or *alternatively forced into the mass or reinforcement particles under pressure...*" Suresh then teaches that this process is known as pressure-drive infiltration and works to yield a generally pore-free, and what one of ordinary skill in the art would call a "dense matrix", thus densification (p. 5, col. 2, para 1, lines 10-12). This densification process has benefits including "increased processing speed..." (p. 5, col. 1, para 2, lines 5-9). The teaching about increased processing speed leads one to conclude that the densification is indeed conducted for a specified period of time, thus the operation is not guesswork started and stopped when the operator feels compelled. This process has a definite speed and is thus conducted in a certain amount of time. Furthermore as this pressure-driven infiltration is also mentioned as the most widely investigated for commercial application (p. 5, col. 2, para 1), this similarly leads one to conclude that the process is conducted in a definite period of time as an indefinite period of time would run contrary to the processes used in commercial applications.

One would be motivated to densify the composite above the melting temperature of the matrix as this obviates concerns about wetting behavior as the matrix is forced to flow around the reinforcements and would cause one to

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have a reasonable expectation of success in yielding stronger composites due to the reduction of porosity.

Cooling the densified mixture below the glass transition temperature of the bulk solidifying amorphous alloy to form a solidified composite material

Peker teaches that the composite is cooled at any cooling rate (col 7, lines 51-54) and one of ordinary skill would reasonable expect to cool below the glass transition temperature at this step so the composite has structural integrity and does not excessively deform or form voids when it is removed from the densification step.

Reheating the solidified composite mixture to a forming temperature for a period of time less than the densification time, wherein the forming temperature is at least 50 °C higher than the densification temperature

Forming the reheated composite mixture into a desired shape at the forming temperature (col 7, lines 59-64)

Peker teaches that the composite may be remelted and formed into desired shapes (col. 7, lines 59-65).

Peker teaches (col. 5, lines 34-46) that a preferred type of bulk-solidifying amorphous alloy for his composite has a low melting point with a eutectic temperature not more than 50 °C lower than the liquidus temperature. One would be motivated to form the claimed composite at a temperature at least 50 °C higher than the densification (above the melting point as specified earlier in the claim) temperature as one would want to ensure low viscosity by having the alloy at a high temperature to safely ensure than even when not at the preferred eutectic composition the alloy would have sufficient liquid phase to ensure low forces for forming. Peker teaches that the difference between the eutectic

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temperature and liquidus is not more than 50 °C. Thus one is making a conservative estimate as to the melting temperature so forming can be carried out with relative ease.

Peker-Johnson further teaches viscosity as a result effective variable in the deformation (forming) of amorphous alloys (col. 2, lines 41-58). Peker-Johnson teaches that "it is desirable to reduce the viscosity of an amorphous alloy as low as 10^5 poise to make deformation possible at low applied forces." Figure 2 of Peker-Johnson then shows that in the viscosity is minimized above the melting temperature (T_m). Lastly, Peker teaches an example (Example 1, col. 8, lines 1-19), where a TiC-amorphous alloy composite was formed through infiltration (through known fabrication technologies for use in other contexts, col. 7, lines 10 and 11) at about 750 °C. This composite mixture was then reheated to about 900 °C and then subsequently cooled to ambient temperature to form an amorphous matrix. The 900 C temperature is plainly more than 50 °C higher than the densification (infiltration) temperature of 750 °C

One would be motivated to conduct the reheating step for a period of time less than the densification step as this step coincides with subsequent forming step used to form useful articles and one of ordinary skill, to minimize cost, would want to heat the composite material as fast as possible to minimize energy costs and to enjoy fast overall processing in conjunction with the subsequent forming step whereas the densification step, from Suresh (p. 5, col. 1, sec. 1.1.1.3., para 2), appears designed to be more slow in that pressure must be exerted on

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molten metal and maintained for a time long enough for solidification to fully run its course.

Quenching the reheated mixture to an ambient temperature to form an amorphous alloy-matrix composite material.

With regards to the final step of “quenching...” the Examiner interprets the term quenching in light of the specification (page 6, lines 20-23) to simply mean cooling at a rate below 500 °C/S to yield an amorphous bulk metallic glass matrix, which is taught by Peker '254 at col. 7, lines 56-60.

Regarding claim 1, it would have been obvious to one of ordinary skill in amorphous metallurgy, at the time the invention was made, taking the disclosures of Peker '254, Suresh, and Peker-Johnson as a whole, to conduct the process of claim 1 as outline above as Peker '254 describes the basic process as shown above and Suresh provides motivation for densifying the metal matrix composition to yield a pore-free matrix (p. 5, col 2, para 1, lines 10-12) while Peker-Johnson provides additional motivation to specifically reheat the composite to temperature at least 50 °C higher than the densification temperature in that viscosity is minimized above the melting temperature.

Regarding claim 2, Peker taught that to retain the advantageous properties of the bulk solidifying amorphous alloy matrix, it should cooled at its critical cooling rate or higher to avoid crystallization and maintain amorphous (col. 2, lines 14-20, col. 7, lines 55-60).

Peker '254 teaches that above the glass transition temperature, thermal strains are avoided and that the matrix can flow (col 3, lines 5-15). Peker-

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Johnson teaches that "it is desirable to reduce the viscosity of an amorphous alloy as low as 10^5 poise to make deformation possible at low applied forces." Figure 2 of Peker-Johnson then shows that in the viscosity is minimized above the melting temperature (T_m). Lastly, Peker teaches an example (Example 1, col. 8, lines 1-19), where a TiC-amorphous alloy composite was formed through infiltration (through known fabrication technologies for use in other contexts, col. 7, lines 10 and 11) at about 750 °C. This composite mixture was then reheated to about 900 °C and then subsequently cooled to ambient temperature to form an amorphous matrix without any crystallization.

Regarding claim 3, Peker '254 teaches that the composite can be cooled "without regard to whether the structure of the solid metal is amorphous..." and then can be "...provided to users who remelt and recast the composite material into desired shapes." (col 7, lines 50-64).

Regarding claims 4-7, Peker '254 teaches that the metal matrix bulk solidifying glass should most preferably have a composition, in atomic percent, of $(\text{Zr,Ti})_{45-67}(\text{Cu,Ni})_{10-38}\text{Be}_{10-35}$ (Abstract).

Peker-Johnson '344 teaches a number of bulk solidifying glass alloys that fit the general formula of Peker '254 and some of T_g and T_x points for these alloys. One exemplary alloy that has a supercooled liquid regime larger than both 60 °C and 90 °C is $\text{Zr}_{50}\text{Cu}_{12.5}\text{Ni}_{10}\text{Be}_{27.5}$ which has a supercooled regime (as defined in the instant application's specification as $T_x - T_g$) of 104 °C.

'344 teaches that "generally speaking, a higher ΔT indicates a lower critical cooling rate for forming an amorphous alloy. It also indicates that there is

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a longer time available for processing the amorphous alloy above the glass transition temperature.” (col 12, line 65 to col 13, line 4). One would be motivated to select such an alloy with a ΔT or supercooled liquid regime above 90 °C as ‘344 further teaches that “A ΔT of more than 100 °C indicates a particularly desirable glass-forming alloy.” (col 13, lines 4-5).

Regarding claim 8, Peker ‘254 teaches, in regard to his $(Zr,Ti)_{45-67}(Cu,Ni)_{10-38}Be_{10-35}$ class of alloys, that “aluminum can be substituted for the beryllium in an amount up to about half of the beryllium present...” (col 5, lines 60-63).

Regarding claim 10, Peker ‘254 teaches the reinforcement material should have a melting point at least 600 °C above the melting point of the matrix alloy (col 3, lines 7-15).

Regarding claims 11-13, Peker ‘254 teaches in col 8, Ex. 1, the use of tungsten carbide particles as the reinforcing material. Also see col 4, line 64 to col 5, line 6.

Regarding claim 14, Peker ‘254 teaches that the infiltration of a melt into a packed mass of particles is a known fabrication technology (col 7, lines 7-11). Furthermore, Suresh teaches that “in infiltration processes, a perform of the reinforcing phase if often formed prior to infiltration...pressing to the desired volume fraction.” (p. 17, col 1, section 1.5.1, para 2, lines 1-5). It would obvious to one of ordinary in the art at the time of the invention to increase the packing density of the pre-densification mixture as a matter of the optimization of process conditions in the course of routine experimentation.

Regarding claim 15, Suresh teaches that creating a vacuum around the reinforcement provides a sufficiently large pressure difference to drive infiltration (p. 5, col 1, para 1, lines 1-3). One can further infer that such a process will reduce porosity (p. 18, col 1, para 2, lines 1-6).

Regarding claim 16, Peker '254 teaches that his bulk solidifying alloy composites can be remelted and recast into various shapes (col 7, lines 51-65) and one of ordinary skill would recognize extrusion above the melting temperature of the matrix as a forming of casting.

Regarding claim 17, Suresh teaches pressure-driven infiltration of a molten metal into a mass of reinforcement material where the pressure is delivered by a piston of a hydraulic press (p. 5, col 1, para 3, lines 1-4), which one of ordinary skill in the art would recognize as producing hydrostatic force.

Regarding claim 19, Suresh teaches that composites produced by pressure-driven infiltration are generally pore-free (p. 5, col 2, lines 10-12) and one of ordinary skill in the art would interpret "pore-free" as meaning greater than 99% dense.

Regarding claim 20, Peker '254 teaches that in the most preferable embodiment of his invention, the reinforcement phase occupies from about 70 to 85 volume percent of the total material (col 4, lines 21-24). One of ordinary skill would further know that too high a volume percent of reinforcement makes a homogenous mixture of reinforcement surrounded by matrix difficult (col 4, lines 16-19).

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4. The previous rejection of claim 9 under 35 U.S.C. 103(a) over **Peker** (US 5,866,254) in view of **Suresh** (Fundamentals of Metal-Matrix Composites...) and **Szuecs** (Mechanical properties of...) in the Office action dated March 21st, 2008, **has been maintained.**

The disclosures of Peker '254, Suresh, and Peker-Johnson were discussed in the 103 rejection to the independent claim 1 above, however none of the references mentions the inclusion or formation of a ductile crystalline phase precipitate.

Regarding claim 9, Szuecs teaches (p. 1512, col 2, para 2, "conclusions", lines 1-8) "a new class of ductile β phase reinforced bulk metallic glass composites were made by an easily feasible in situ processing method from a homogeneous $\text{Zr}_{56.2}\text{Ti}_{13.8}\text{Nb}_{5.0}\text{Cu}_{6.9}\text{Ni}_{5.6}\text{Be}_{12.5}$ melt. The microstructure of the resulting two phase material consists of a dendritic Zr-Ti rich β phase with a body centered cubic structure, which is embedded in a fully amorphous matrix." The particular bulk solidifying glass alloy used, $\text{Zr}_{56.2}\text{Ti}_{13.8}\text{Nb}_{5.0}\text{Cu}_{6.9}\text{Ni}_{5.6}\text{Be}_{12.5}$, has exceptional glass forming ability with a critical cooling rate below 500 C/S (p. 1507, col 1, lines 1-4). Furthermore, "the preparation of bulk metallic glass matrix composites with ductile metal and refractory ceramic particles as reinforcement has yielded improvements in tensile and compressive strains to failure." (p. 1507, col 1, lines 18-23).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Szuecs with the combination of Peker '254 in view of Suresh established in the 103 rejection to the independent claim 1 above

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to form a ductile phase as Szuecs teaches that the inclusion of ductile metal precipitates tends to improve tensile and compressive strains to failure and thus make such a composite stronger.

5. The previous rejection of claim 18 under 35 U.S.C. 103(a) over **Peker** (US 5,866,254) in view of **Suresh** (Fundamentals of Metal-Matrix Composites...) and **Peker-Johnson** (US 5,288,344) as applied to claims 1-8, 10-17, and 19-20 in further view of **Neil** (US 4,952,353) in the Office action dated March 21st, 2008, **has been maintained.**

The disclosures of Peker '254, Suresh, and Peker-Johnson teach were discussed in the 103 rejection to claim 1 above, and Peker '254 further teaches that the infiltration of a melt into a packed mass of particles is known fabrication technologies for use in other contexts (col 7, lines 8-11) however none of the cited references teach the use of hot isostatic pressing (HIP).

Neil teaches a hot isostatic pressing as a process for densifying porous articles to produce low porosity articles (col 1, lines 5-10).

Regarding claim 18, it would have been obvious to one of ordinary skill in the art at the time the invention was made to take the combination of Peker '254 (and Peker-Johnson) in view of Suresh and combine it in further view of Neil to use hot isostatic pressing about the melting point of the matrix as Neil taught that hot isostatic pressing in an effective means of porosity removal (col 1, lines 14-16). The instant application also mentions in the specification the use of an encapsulating agent (canning agent) to contain the composite during densification. In Neil's process of hot isostatic pressing, glass is used as the

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encapsulating agent that melts around the ceramic particles -- one of ordinary skill in the art could utilize this known process with no respective change in its function (changing from glass to a low melting point bulk metallic glass alloy) and yield a reasonable expectation of success in affecting densification.

Response to Applicant's Arguments:

6. Applicant's arguments filed June 23rd, 2008 have been fully considered but they are not persuasive.

Applicants submit (p. 6, para 3) that splitting or delaying the densification and shaping/forming step is crucial for making high-volume reinforcement composites of BSAA's and that such a teaching is not indicated in the prior art. Applicants further assert that splitting or delaying has been avoided by the prior art due to cost.

In response, the disclosures of Peker '254, Suresh, and Peker-Johnson were shown in the 103 rejection to claim 1 to meet the claimed process limitations of claim 1 in densification followed by cooling and then remelting for shaping/forming.

Applicants assert that the BSAA needs to be cooled sufficiently fast to retain its amorphous structure and this causes significant complications in a single step process as evidenced by Suresh.

In response, instant claim 3 controverts the assertion regarding the cooling rate as their is an embodiment where the intermediate cooling step is performed such that the matrix becomes "substantially crystalline". Secondly, Suresh states at p. 5, Section 1.1.1.4, para 2, that "if cold dies and

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reinforcements are used, or if high pressures are maintained during solidification, matrix-reinforcement chemical reactions can be minimized and attractive, defect-free matrix microstructures can be achieved."

Applicants assert (p. 7, para 3) that "none of the prior art references teach the necessary information to allow one of skill in the art to arrive at the claimed two-step composite formation method."

In response, the Examiner need only establish a prima facie case of obviousness by showing that the claimed invention as a whole, would have been obvious to one of ordinary skill in the art, as shown in the 103 rejection to claim 1, *supra*.

Applicants assert (p. 8, bullet 1) that the example cited in Peker teaches the opposite approach in terms of comparative heating times for densification and remelting.

In response, the section of Peker was cited for the purpose of teaching the more than 50 °C temperature limitation. Furthermore the one minute referenced by Applicants was the period of contact between the TiC and the molten metal, not the total heating time and thus does not in any way teach away.

Applicants assert (p. 8, bullet 2) that "there is simply no teaching in any of the cited prior art references for such a second forming/shaping step" except for Suresh "which teaches a single-step liquid-phase infiltration."

In response, Peker '254 teaches that "this latter embodiment... may be used, for example, in remelt operation wherein an ingot of the composite material is prepared at a central location and provided to user who remelt and recast the

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composite material into desired shape. (col. 7, lines 59-64). Also, Suresh does not teach that pressure infiltration is designed to produce the final shape and thus leaves open subsequent machining, shaping, and forming operations.

Lastly, Applicants assert (p. 9, para 1-2) that Szuecs and Neil do not "teach, describe, or even suggest" a two-step methodology.

In response, Szuecs and Neil were not used to teach a two-step methodology for this was already suggested by Peker in view of Suresh and Peker-Johnson as explained above.

Pertinent Prior Art

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

K.Q. Qiu and Y.L. Ren, Melt infiltration casting of $Zr_{57}Al_{10}Nb_5Cu_{15.4}Ni_{12.6}$ amorphous matrix composite, *Journal of Minerals & Materials Characterization & Engineering*, (2004) Vol. 3, No. 2, p. 91-98.

R.D. Conner, Mechanical properties of tungsten and steel fiber reinforced $Zr_{41.25}Ti_{13.75}Cu_{12.5}Ni_{10}Be_{22.5}$ metallic glass matrix composites, *Acta mater.* Vol. 46, No. 17, pp. 6089-6102, 1998.

Z. Bian et al, Carbon-nanotube-reinforced $Zr_{52.5}Cu_{17.9}Ni_{14.6}Al_{10}Ti_5$ bulk metallic glass composites, *Applied Physics Letters*, (December 2002) Vol. 81, No. 25.

Conclusion

-- Claims 1-20 are rejected

-- No claims are allowed

The rejections above rely on the references for all the teachings expressed in the texts of the references and/or one of ordinary skill in the metallurgical art would have reasonably understood or implied from the texts of the references. To emphasize certain aspects of the prior art, only specific portions of the texts have been pointed out. Each reference as a whole should be reviewed in responding to the rejection, since other sections of the same

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reference and/or various combinations of the cited references may be relied on in future rejections in view of amendments.

All recited limitations in the instant claims have been met by the rejections as set forth above. Applicant is reminded that when amendment and/or revision is required, applicant should therefore specifically point out the support for any amendments made to the disclosure. See 37 C.F.R. § 1.121; 37 C.F.R. Part §41.37 (c)(1)(v); MPEP §714.02; and MPEP §2411.01(B).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark L. Shevin whose telephone number is (571) 270-3588 and fax number is (571) 270-4588. The examiner can normally be reached on Monday - Friday, 8:30 AM - 5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy M. King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

/Mark L. Shevin/

Examiner, Art Unit 1793/Roy King/
Supervisory Patent Examiner, Art Unit 1793

July 9th, 2008
10-521,424